

I hereby certify that this correspondence is being filed via  
EFS-Web with the United States Patent and Trademark Office  
on 2/26/08  
TOWNSEND and TOWNSEND and CREW LLP  
By: Lata Olivier  
Lata Olivier

**PATENT**  
Attorney Docket No.: 023070-141800US  
Client Ref. No.: 2004-085-1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

John M. Krochta, et al.

Application No.: 10/791,475

Filed: March 1, 2004

For: METHODS AND  
FORMULATIONS FOR PROVIDING  
GLOSS COATINGS TO FOODS AND  
FOR PROTECTING NUTS FROM  
RANCIDITY

Customer No.: 20350

Confirmation No. 2113

Examiner: Carolyn Paden

Technology Center/Art Unit: 1761

**DECLARATION OF DR. JOHN M.  
KROCHTA**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, DR. JOHN M. KROCHTA, hereby declare and state:

1. I am the John M. Krochta who is the first-named inventor of the above-captioned patent application.
2. I am also the John M. Krochta who is the first-named inventor of U.S. Patent No. 6,869,628 (the "628 patent"). The Kirsten L. Dangaran who is named as an inventor of the '628 patent is the same Kirsten L. Dangaran named as an inventor of the above-captioned application.
3. The above-captioned application and the '628 patent are currently owned by the same party, the Regents of the University of California.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: \_\_\_\_\_

\_\_\_\_\_  
DR. JOHN M. KROCHTA

I hereby certify that this correspondence is being filed via EFS-Web with the United States Patent and Trademark Office on 02/26/08 for TOWNSEND and TOWNSEND and CREW LLP and DR. KIRSTEN L. DANGARAN  
By: Lata Olivier  
Lata Olivier

**PATENT**  
Attorney Docket No.: 023070-141800US  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Customer No.: 20350

Confirmation No. 2113

Examiner: Carolyn Paden

Technology Center/Art Unit: 1761

DECLARATION OF DR. KIRSTEN L.  
DANGARAN

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, DR. KIRSTEN L. DANGARAN, hereby declare and state:

1. I am the Kirsten L. Dangaran who is named as an inventor of the above-captioned patent application.
2. I received a B.Sc., in Chemistry, *summa cum laude*, from the Ohio State University in 1996, where I was elected to Phi Beta Kappa. I received a Ph.D. in Food Science from the University of California at Davis in 2005. My doctoral research concerned the properties of whey protein films and coatings, including their gloss characteristics.

Application No: 10/791,475  
Declaration of Dr. Kirsten L. Dangaran

PATENT

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3. I understand that the Examiner has cited against the claims pending in the application Best et al., U.S. Patent Application Publication 2005/0118311 (hereafter, "Best"). I have been informed that the Best application was filed on December 2, 2003.

4. Attached to this Declaration are copies of pages 74 and 75 from my laboratory notebook, recording work I did in my laboratory at the University of California at Davis. The dates on the pages have been redacted, but they are all before December 2, 2003.

5. As set forth on the first page, number 74, the purpose of the experiment recorded on that page was to compare the gloss of films made from whey protein concentrate, which I abbreviated as "WPC", whey protein isolate, which I abbreviated as WPI, and B-lactoglobulin, which I abbreviated as B-gal, plasticized with sucrose. My hypothesis was that there would be no significant difference in gloss.

6. As set forth on page 74, I prepared film solutions using WPI, B-gal, and three different WPCs. The page records that I was unsuccessful in forming films from the WPC solutions as they had all gelled. After consulting a reference, I determined how to prevent the solutions from gelling.

7. As recorded on page 75, I then made fresh protein solutions, made duplicate casts of films made from the solutions, let the films dry overnight, and measured the gloss of the films.

8. As recorded on page 75, the film made from 35% WPC as the protein made the most "mirror-like" coating.

9. I therefore succeeded in forming gloss coatings as claimed in the present application, in the United States, before the December 2, 2003 filing date of Best.

Application No: 10/791,475  
Declaration of Dr. Kirsten L. Dangaran  
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PATENT

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: February 26, 2008

  
Dr. Kirsten L. Dangaran

**KIRSTEN L. DANGARAN, PH.D.**

Kirsten\_Dangaran@yahoo.com

2442 Brentwood Rd.

Bexley, OH 43209

614-253-3038

**EDUCATION**

**Ph.D. in Food Science, University of California, Davis, 2005.**

Dissertation Title: *PLASTICIZER CRYSTALLIZATION IN WHEY PROTEIN FILMS AND COATINGS: EFFECT ON APPEARANCE, BARRIER AND MECHANICAL PROPERTIES*

*Principal Advisor:* Dr. John M. Krochta

**B. Sc., in Chemistry, *summa cum laude*, The Ohio State University, 1996.**

Member, Phi Beta Kappa.

**PROFESSIONAL EXPERIENCE:**

Research Food Technologist, Eastern Regional Research Center-ARS-USDA, Dairy Processing and Products Research Unit (November 2004-2007). *Study techniques for the separation and fractionation of milk and dairy proteins. Using the knowledge of proteins chemistry, polymer science, material mechanics and mass transfer thermodynamics, determined and improved the appearance, barrier and mechanical properties of edible films made from casein and casein fractions.*

Research Assistant, UC-Davis - Biopolymer Films Laboratory (July 2000-November 2004). *Studied crystallization kinetics of plasticizers in whey protein films. Analyzed the effects of plasticizer crystallization and crystallization inhibitors on appearance, barrier and mechanical properties in films and coatings.*

Research Assistant, Ross Laboratories Division of Abbott Laboratories through Olsten Employment Services (October 1996 – July 1998).

*Worked in R&D department of adult medical nutrionals formulating and studying product prototypes. Worked on product development of Ensure Bar™.*

Researcher, Ohio State University Department of Chemistry (June 1995-September 1995) *Developed HPLC laboratory experiment to analyze the flavonoids in orange juice.*

**Additional Training:**

March 2003, “Chocolate Technology”, Teaching Institute for the Confectionery and Chocolate Industries, Richardson Researches, Inc.

March 2001, "Adhesion Science and Technology", Center for Professional Advancement

March 2006, "Introduction to Supervision", USDA Graduate School

## **PUBLICATIONS:**

*"Whey Protein-Sucrose Coating Gloss and Integrity Stabilization by Crystallization Inhibitors"* with John Krochta and Jody Renner-Nantz, Journal of Food Science, 71(3): E152-E157, 2006 (first author).

*"Preventing the Loss of Tensile, Barrier and Appearance Properties Caused by Plasticizer Crystallization in Whey Protein Films"* with John Krochta, International Journal of Food Science and Technology, accepted, 2006 (first author)

*"Kinetics of Sucrose Crystallization in Whey Protein"* with John Krochta, Journal of Agricultural and Food Chemistry, 54(19): 7152-7158, 2006 (first author).

*"Improving Physical Properties of CO<sub>2</sub>-Precipitated Casein Films by Reducing Protein Particle Size"* with Peggy Tomasula and Peter Cooke, Journal of Food Science, 71(4): E196-E201, 2006 (first author).

*"Blends of Cysteine-Containing Proteins. Journal of Agricultural and Food Chemistry"* with Justin Baron and Walter Schmidt, Journal of Agriculture and Food Chemistry, 54(15): 5393-5399, 2006.

*"Aqueous Whey Protein Coatings for Panned Products"* with John Krochta, The Manufacturing Confectioner, January: 61-65, 2003. (first author)

*"Consumer Acceptance of Whey-protein-coated as Compared with Shellac-coated Chocolate"* with Soo-Yeun Lee, J. X. Guinard and John Krochta, Journal of Food Science 67(7): 2764-2769, 2002.

*"Gloss Stability of Whey Protein/Plasticizer Coating Formulations on Chocolate Surface"* with Soo-Yeun Lee and John Krochta, Journal of Food Science 67(3): 1121-1125, 2002.

## **PATENTS AND APPLICATIONS:**

*"Methods and Formulations for Providing Gloss Coatings to Foods and for Protecting Nuts from Rancidity"* with John M. Krochta, Soo-Yeun Lee and Thomas Trezza, Patent 6,869,628, March 2005.

*"Water-based Gloss and Oxygen-Barrier Coatings for Confections, Nuts and Other Food Products"* with John M. Krochta and S-Y Lin. Patent-pending.

## **WORKS IN PROGRESS:**

*"Empirical Modeling of Physical Properties of Casein Films as Affected by Plasticizer Content"* with Peggy Tomasula. (first author)

*"Protein-Transition Metal Ion Networks"* with Justin Barone (first author) and Walter Schmidt

*"Whey in Edible Films"* with John Kroccta, chapter for a book tentatively titled **Whey Processing, Functionality and Health Benefits** (C. Onwulata and P. Huth, editors).

*"Structure and Function of Protein-Based Edible Films and Coatings"* with Peggy Tomasula and Phoebe Qi, chapter for a book on edible films and coatings (M. Embuscado, editor)

#### **TEACHING EXPERIENCE:**

Teaching Assistant, UC- Davis Department of Food Science and Technology  
*Food Preservation - Spring 2001, Spring 2002*

Teaching Assistant, Stanford University Department of Chemistry  
*Organic Chemistry Lecture and Laboratory - Fall 1998, Winter and Spring 1999*

#### **SERVICE AND LEADERSHIP ACTIVITIES:**

2006-2008, IFT Dairy Division, Member-at-Large  
2004-2005, ERRC-ARS-USDA Women's Federal Committee - Member  
2003-2004, UC Davis Food Science Graduate Student Association – President  
2001-2002, UC Davis Food Science Graduate Student Association – President  
2000-2001, UC Davis Food Science Graduate Student Association – Media Chair

#### **CONFERENCE PRESENTATIONS AND POSTERS:**

##### **Oral Presentations:**

*"Edible Films and Coatings: Technology and Applications"* at the Intertech-Pira International conference on Biodegradable Plastics in Packaging Applications, Chicago, IL, 2006.

*"Packaging, Films and Coatings: Research Technologies and Applications"* at the Industrial Forum on Responsible Packaging, Baltimore, MD, 2006

*"Structure, Properties and Applications of Edible Films and Coatings from Dairy Proteins"* presented at the 97th American Oil Chemists' Society Annual Meeting and Expo, St. Louis, 2006

*"Kinetics of Sucrose Crystallization in Whey Protein Films as Affected by Inhibitors"* presented at the Institute of Food Technologists Annual Meeting and Food Expo, Las Vegas, NV, July 2004.

*"Sucrose Crystallization in Native and Denatured Whey Protein Isolate Films"* presented at the Institute of Food Technology Annual Meeting, Chicago, July 2003.

*"Effect of Sucrose Level on Gloss and Durability of Whey Protein Isolate Coatings for Confectionery Product"* presented at the Institute of Food Technology Annual Meeting, Anaheim, June, 2002.

*"Whey Protein Isolate Coatings as Replacements for Shellac in the Confectionery Industry"* presented at the Institute of Food Technology Annual Meeting, New Orleans, June 2001.

**Poster Presentations:**

*"Blended Films of Novel Casein with Four Different Carrageenans to Improve Properties"* presented at the Institute of Food Technologists Annual Meeting and Food Expo Chicago, IL, 2007

*"Predicting Biopolymer Film Function Using Plasticizer Efficiency Ratings"*, presented at the Institute of Food Technologists Annual Meeting and Food Expo Orlando, FL, 2006

*"Effect of Plasticizer Crystallization on Gloss, Barrier, and Tensile Properties of Whey Protein Films"* presented at the Institute of Food Technologists Annual Meeting and Food Expo, New Orleans, LA, July 2005.

*"Crystallization Inhibitor Effect on the Rate of Gloss Fade of Whey Protein Coatings"* presented at the Institute of Food Technologists Annual Meeting and Food Expo, Las Vegas, NV, July 2004.

*"Effect of Sucrose Level on Gloss and Durability of Whey Protein Isolate Coatings for Confectionery Product"* presented at the International Conference of Food Science and Technology, Wuxi, China, October 2003 and the California Institute of Food and Agricultural Research Conference XVIII: Food Processing for Today's Consumer, Davis, November 2003.

**FELLOWSHIPS AND AWARDS:**

2006	USDA Merit Award – Outstanding Performance
2005	USDA Merit Award – Outstanding Performance
2004	IFT Packaging Division Poster Competition, finalist
2004	IFT Manfred Kroger Graduate Student Competition, Dairy Division, finalist
2004	Outstanding Citizen Award, UC Davis Food Science Department
2003-2004	IFT Graduate Student Scholarship
2003-2004 and 2001-2002	Jastro-Shields Research Fellowship
2003, 2002, and 2001	Thomas Nickerson Travel Award
2002 and 2001	Chaines de Rotisseurs Foundation Award
2002	California Dairy Industries Scholarship
2001	Western Candy Conference Award
2001	IFT Manfred Kroger Graduate Student Competition, Dairy Division, 2 <sup>nd</sup> place
1996	Phi Beta Kappa

**PROFESSIONAL MEMBERSHIPS:**

Institute of Food Technology

Sigma Xi

American Chemical Society

Purpose: I will be comparing when protein concentrates (WPC), WPI, and  $\beta$ -lactoglobulin ( $\beta$ -lg) films plasticized with sucrose for glass. I will compare WPC-35% protein, WPC-65% protein, WPC-80% protein, WPI and  $\beta$ -lg films.

Hypothesis: There will be no significant difference among the samples in terms of gloss.

Formulations:

	WPI	WPC-35	WPC-65	WPC-80	$\beta$ -lg
Water	45g	45g	45g	45g	45g
Protein	5g WPI	5g WPC-35	5g WPC-65	5g WPC-80	5g $\beta$ -lg
Sucrose	0g	15g	0g	15g	15g

I will make each film solution by dissolving the protein in water, heating for 30 min in a 90°C water bath, cooling then adding the sucrose. Once the sucrose is dissolved, I will drop the solutions then cast them on flat black male acrylic plates. I will start with a wet film thickness of 50 mic and use a Bird-type applicator to cast the films.

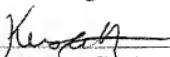
- Notes + Observations:

After heating, the WPC solutions had all gelled. After consulting Jason McKittrick's thesis, it was learned that I should increase the pH of the protein solution to pH 8 prior to heating to prevent gel formation.

I will redo solutions

Continued on Page

I and Understood By



Signed

Signed

Date

## Results of Solutions with pH 8

I will use 5N sodium hydroxide to increase the pH of the protein solutions. I will use a pH meter to measure

5N NaOH

$$\text{NaOH MW} = \frac{40.0}{\cancel{1.000 \text{ g/mol}}}$$

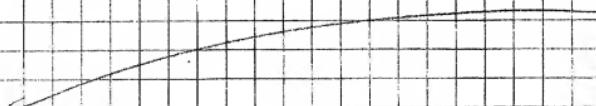
$$5 \text{ mol} \times \frac{40.0}{\cancel{1 \text{ mol}}} \times \frac{1}{\cancel{1000 \text{ g/mol}}} \times 25.0 \text{ ml} = 1.25 \text{ g NaOH to be dissolved in 25 ml of water}$$

After drying overnight I measured glass

	WPC-35-1	WPC-35-2	WPC-68-1	WPC-68-2	WPC-81-1
20°	88.5	90.5	83.5	70.3	65.8
60°	94.2	93.1	93.0	91.4	89.10
85°	100.5	100.7	99.7	98.3	95.1

	WPC-81-2	WPC-7-1	WPC-7	B-loc-1	B-loc-2
20°	58.5	89.9	86.0	88.7	89.0
60°	88.9	94.9	93.7	94.0	94.11
85°	94.0	99.7	96.3	98.5	98.2

WPC-35 samples are the most rubber-like coatings



Continued on Page \_\_\_\_\_

Read and Understood By

Kurtos

Signed

Date

Signed

Date